

DOES ORGANIZATION CONTEXT HAVE AN IMPACT ON PRODUCT INNOVATION?-A STUDY ON SOFTWARE DEVELOPMENT ORGANIZATIONS IN KERALA WITH SPECIAL EMPHASIS ON UST-GLOBAL, KOCHI

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ABSTRACT

Purpose – The main purpose of this paper was to investigate the relationships between organization context (as explained by performance management and social support organization), Contextual ambidexterity and new product innovation outcomes (Radical Innovation, Incremental innovation and Speed to market). The paper formulated 3 hypotheses from the literature review. These hypotheses were tested using structural equation modeling with data collected from the employees of UST Global, Kochi. The findings indicated that a high positive correlation exist between the organizational context and new product innovation and that contextual ambidexterity does not mediate the relationship OC and PI. The results of this study could be used by any manager of the IT organization concerned to improve the performance management and the support system to maneuver the employees to handle successful innovation projects. The results also provide companies operating IT sector in kerala with useful information on how their policies and actions might affect exploration and exploitation of employee competences and consequently firm innovation.

KEYWORDS: Product Innovation, Software Development Organization, Contextual Ambidexterity, Organization Contexts

INTRODUCTION

One of the more enduring ideas in organization science is that an organization's long-term success depends on its ability to exploit its current capabilities while simultaneously exploring fundamentally new competencies (Levinthal and March 1993, March 1991). Earlier studies often regarded the trade-offs between these two activities as insurmountable, but more recent research describes *ambidextrous* organizations that are capable of simultaneously exploiting existing competencies and exploring new opportunities. Building upon earlier work by Duncan (1976), Tushman and O'Reilly (1996) were first to present a theory of organizational ambidexterity. They suggest that superior performance is expected from the ambidextrous organization and describe structural mechanisms to enable ambidexterity. In recent years, the concept of organizational ambidexterity has gained momentum in research on organizations particularly with regard to contextual ambidexterity. Despite increasing interest in ambidexterity as a concept, an examination of the literature indicates that several important research issues remain unexplored, ambiguous, or conceptually vague. The study focuses on the following research questions: First, Whether the context provided by the IT organization support ambidexterity Second, to what extent is the existence of contextual ambidexterity in the organization. Third, how do the organization context factors affect the exploitation and exploration of competences of the employees in the organization under study? Does it stimulate creativity and innovation in employees in the organization? Fourth, what relationship exists between Organization context, contextual ambidexterity and product innovation in the organization under study?

LITERATURE REVIEW

Raisch and Birkinshaw (2008), Gibson and Birkinshaw (2004) were the first to provide empirical evidence showing that ambidexterity increases a unit's performance by enabling the unit to be innovative and flexible without losing the benefits of accumulated experience and efficiency. (Jansen et al, 2010). Organizational ambidexterity as a metaphor referring to firms' ability to both explore new competences and exploit existing competences has attracted considerable interest (Gibson and Birkinshaw, 2004; Raisch et al., 2009; Simsek et al. 2009; Tushman and O'Reilly, 1996, 1997), especially in new product innovation research. (Atuahene-Gima, 2005; He and Wong, 2004). Balancing exploration and exploitation for the purposes of successful management of employees competences for new product innovation and long-term survival is a critical and challenging task (March, 1991; McGrath, 2001; McNamara and Baden-Fuller, 1999). However, recent research suggests that contextual ambidexterity (i.e. simultaneous perusal of exploration and exploitation of the competence within a business unit) is not only possible but also a necessity to business success, especially in IT sector that often have no choice but to exploit existing competences for short-term commercial benefits and simultaneously explore new competences for long-term success (Gibson and Birkinshaw, 2004). It is argued that contextual ambidexterity is grounded in and supported significantly by an organizations context (Ghoshal and Bartlett, 1994) that promotes both creativity and discipline (Jelinek and Schoonhoven, 1993), or both the presence of different knowledge and the integration of multiple perspectives to develop a cohesive point of view (Eisenhardt and Schoonhoven, 1990).

THEORETICAL BACKGROUND & RESEARCH HYPOTHESES

Organization Context

Sumantra Ghoshal and Chris Bartlett (1994) were the first to define the context as the "often invisible set of stimuli and pressures that motivate people to act in a certain way". (Gibson and Birkinshaw, 2004). The top management shapes the context through systems, incentives and controls and actions which they take on a day to day basis. It is then reinforced through the behaviors and attitude of the people throughout the organization. Ghoshal and Bartlett argue that four set of attributes-stretch, discipline, support and trust-interact to define an organizations context. Gibson and Birkinshaw (2004) reduced these four into two dimensions of organization context: the first Performance Management (a combination of stretch and Discipline) is concerned with stimulating people to deliver high quality and making them accountable for their actions; the second social support (a combination of support and trust) is concerned with providing people with the security and latitude they need to perform. PM and SS are equally important and mutually reinforcing. The strong presence of each will create high performance organizational context that give rise to truly ambidextrous organization (Gibson and Birkinshaw 2004). That means higher the 'high performance context' higher will be exploitation and exploration of competence of the employees which makes the so called ambidextrous organization. However if there is an imbalance in these organizational characteristics or lack of both, a less than optimal organizational context will exist (Gibson and Birkinshaw, 2004). In fact Ghoshal and Bartlett (1994) framework for organizational effectiveness talks about how when the leaders in the business unit when provided them with supportive environment develops contextual ambidexterity.

Contextual Ambidexterity

Contextual ambidexterity is the behavioral capacity of the employees to simultaneously demonstrate alignment and adaptability (Gibson and Birkinshaw, 2004) or exploration and exploitation (Tushman and O'Reilly, 2004). It is called 'contextual' because it arises from the features of its organizational context (Gibson and Birkinshaw, 2004). Under the traditional bi-polar view of ambidexterity, exploitation is seen as associated with efficiency and productivity through the

use of existing or similar solutions, but the existing knowledge frame hinders breakthrough innovations. Therefore, exploitation facilitates learning through knowledge refinement with moderate but certain and immediate returns (Hughes, Hughes and Morgan, 2007), increasing incremental product innovations but hindering radical innovation (Christensen and Bower, 1996). Conversely, exploration promotes learning through knowledge creation with potentially high but uncertain returns (Hughes and Morgan, 2007), but often at the expense of efficiency. Therefore, exploration increases radical product innovations but impedes incremental innovations (Atuahene- Gima, 2005). As a result, extant research has largely examined the respective effects of exploration and exploitation on radical and incremental product innovations, and a balance of exploration and exploitation is often gauged through their interaction effect (Atuahene-Gima, 2005) or aggregate dimension (He and Wong, 2004).

Innovation

"Innovation is the degree to which changes are intentionally implemented that is new to the organisation" (Mohr, 1969). Damanpour (1991) defined innovation as "the generation, development, and adaptation of novel ideas on the part of the firm". The European Commission Green paper (1999) on innovation defines innovation as "the successful production, assimilation and exploitation of novelty in the economic and social spheres". Nohria and Gulati (1996) defined innovation to "include any policy, structure, method or process, or any product or market opportunity that the manager of an operating unit perceives to be new. "Zaltman et al.(1973) defined innovation as "any idea, practice, or material artifact perceived to be new by the relevant unit of adoption"."Innovation is the creation of a new product–market–technology–organization combination" (Boer and During, 2001).

Ambidextrous organization excel at exploiting existing products to enable incremental innovation and at exploring new opportunities to foster more radical innovation. (Andriopoulos and Lewis, 2009). The very need to survive, excel or prosper calls for excellence in both exploratory and exploitative Innovation (Tushman and O'Reilly, 1996). That is the innovation requires for exploiting existing competences and exploring new competences. Drawing on such insights, it is conceptualized for the study that the Innovation which is required for ambidexterity is the radical innovation and incremental innovation. Radical innovations (sometime referred to as breakthrough, discontinuous or disruptive innovations) provide something new to the world that we live in by uprooting industry conventions and by significantly changing customer expectations in a positive way. Ultimately, they often end up replacing existing methods / technologies (Martin Gilliards).

Incremental innovation (sometimes referred to as sustaining innovation) uses existing forms or technologies as a starting point. It either makes incremental improvements to something or some process or it reconfigures it so that it may serve some other purpose. The integration of the two activities improves the performance by making the organization 'innovative, flexible and effective without losing the benefit of stability, routinization and efficiency'(Simsek ,2009,p 603). It is found that contextual ambidexterity has a profound impact on innovation (Wang and Rafiq, 2012).

OBJECTIVES OF THE STUDY

- To Identify the Organization context existing in UST global
- To determine whether organization context of the software industry accentuate Contextual ambidexterity
- To determine the effect of Organization context on Product innovation.
- To determine whether contextual ambidexterity mediates the relationship between organization context and Product innovation.

HYPOTHESIS

- High performance context leads to a) Higher Contextual ambidexterity b) Higher NPI.
- Contextual ambidexterity mediates the relationship between organization context and product innovation.

METHODOLOGY

The research study is explanatory and correlational. It is basically a hypothesis testing research study. The sampling frame is software development employees precisely programmers, team lead, project lead and project managers of UST GLOBAL, Kochi, Kerala. The sample size is 53. Simple random sampling design has been applied. The data shall be collected through standardized questionnaire and personal interview. Structural equation modeling using AMOS software would be used for the data analysis. The questionnaire as been pretested and reliability has been checked using Cronbach alpha.

ANALYSIS AND RESULTS

The following table gives Characteristics of the participants in the survey.

Table 1: Characteristics of Participants Participated in the Survey

Age	Frequency	Percent
20-30 yrs	32	60.4
31-40 yrs	21	39.6

Gender	Frequency	Percent
Male	22	41.5
Female	31	58.5

Designation	Frequency	Percent
Programmer	27	50.9
Team Leader	11	20.8
Project leader	9	17
Project manager	6	11.3

Experience in Present Organisation	Frequency	Percent
Less than 1 year	5	9.4
1- 5 years	30	56.6
5 -10 years	15	28.3
Above 10 years	3	5.7

Total Experience in IT	Frequency	Percent
1- 5 years	17	32.1
5 -10 years	31	58.5
Above 10 years	5	9.4

Experience in Industry Other than IT	Frequency	Percent
Nil	45	84.9
More than 1 year	8	15.1

Instrument

The survey instrument was developed by the researchers after an extensive review of literature and scales used indifferent educational backgrounds guided by the theoretical base of the study. This instrument was sent to experts who were working in the field of management in different universities to determine its face and content validity. The instrument was improved in the light of the feedback from these experts. A pilot study was conducted to establish its internal consistency and reliability. After analyzing the data resulting from the pilot study, two items were removed from the instrument. The following table gives the reliability of the measures considered.

Table 2: Reliability variables Considered

Variables	Cronbach's Alpha	No of Items
Competence exploration	0.934	5
Competence exploitation	0.916	5
Radical product innovation	0.944	2
Incremental product innovation	0.902	2
Speed to market	0.911	4
Performance management context	0.875	6
Social support context	0.943	5

Data Analysis

The data were analyzed via SPSS 20.0 for Windows. Descriptive statistics were used to describe and summarize the properties of the mass of data collected from the respondents. Parametric statistics like ANOVA and t-test comparison were conducted to analyze any differences between organization context, contextual ambidexterity, new product innovation and other dependent variables. To determine the extent of ambidextrous culture, contextual ambidexterity, Organization context and New Product Innovation the mean % score $\left[= \frac{\text{MeanScore} \times 100}{\text{Maximum possible score}} \right]$ and one sample Z test is carried out. A level of 0.05 was established a priori for determining statistical significance.

Test of the Proposed Model

Structural equation modeling (SEM) was performed to test the fit between the research model and the obtained data. This technique is chosen for its ability to examine a series of dependence relationships simultaneously, especially where there are direct and indirect effects among the constructs within the model. In this study, AMOS 18.0 was used and the SEM estimation procedure is maximum likelihood estimation.

FINDINGS

One of the objectives of the study was to determine the extent of organization context, in UST GLOBAL, Kochi.

Table 3: Mean, SD and Mean % Score

Variable	Mean	Std. Deviation	Mean % Score	t	df	P Value
Organization context	54.08	11.60	70.23%	-2.307	52	0.025

The mean percentage score of the ambidextrous culture is 70.23% which indicate that a medium level of organization context exists in the organization. To test whether the sample information that we observed exist in the population or to verify that the level of organization context in UST Global Kochi is medium or it is high, we formulated the hypothesis that the mean percentage score is 75% (high) percent of the maximum possible score against it is less than

75% (medium). To test the above hypothesis we used one sample t test and the result is exhibited in Table 3. From the table the calculated value of t is -2.307 which is less than -1.675 which indicates that the test is significant. So we concluded that the only a medium level of organizational context exists in UST Global Kochi.

The second aim for this study was to investigate whether the scores differs with the Characteristics of participants like age, gender, designation and experience. An independent sample t-test was conducted to compare the mean scores of organization context, contextual ambidexterity and new product innovation by gender (male vs. female) and in the age group. As seen in Table 4, there were no significant differences between females' and males' mean scores of contextual ambidexterity, organization context and new product innovation. Similar results exist in the case of Age group (Table 5).

Table 4: Means and Standard Deviations and t –Value Comparing to Gender

Variable	Gender	N	Mean	Std. Deviation	t	P
Organization context	Male	22	52.91	11.85	-0.613	0.543
	Female	31	54.90	11.54		
Contextual ambidexterity	Male	22	70.68	15.41	0.217	0.829
	Female	31	69.77	14.66		
New product innovation	Male	22	66.64	9.07	-0.003	0.997
	Female	31	66.65	9.66		

Table 5: Means and Standard Deviations and t –Value Comparing to Age

Variable	Age	Mean	Std. Deviation	t	P
Organization context	20-30 yrs	55.31	12.08	0.958	0.343
	31-40 yrs	52.19	10.83		
Contextual ambidexterity	20-30 yrs	71.97	14.52	1.103	0.275
	31-40 yrs	67.38	15.24		
New product innovation	20-30 yrs	67.81	8.59	1.131	0.263
	31-40 yrs	64.86	10.33		

A one-way between-groups analysis of variance was conducted to explore the impact of designation and experience on levels of ambidextrous culture, contextual ambidexterity, organization context and new product innovation. The results are exhibited in Table 6 and Table 7. The test shows that there is no significant difference exists between the designation and experience.

Table 6: Means and Standard Deviations and F–Value Comparing to Designation

Variable	Designation	N	Mean	Std. Deviation	F	P
Organization context	Programmer	27	54.63	11.97	0.299	0.826
	Team Leader	11	55.00	11.91		
	Project Leader	9	54.11	11.65		
	Project Manager	6	49.83	11.30		
Contextual ambidexterity	Programmer	27	68.78	13.81	1.031	0.387
	Team Leader	11	66.09	15.71		
	Project Leader	9	75.89	18.02		
	Project Manager	6	75.17	12.22		
New product innovation	Programmer	27	66.70	9.66	0.202	0.895
	Team Leader	11	65.73	11.82		
	Project Leader	9	68.56	6.54		
	Project Manager	6	65.17	7.83		

Table 7: Means and Standard Deviations and F –Value Comparing to Experience

Variable	Total Experience in IT	N	Mean	Standard Deviation	F	P
Organisation context	Less than 1 year	5	51.80	6.14	1.131	.0346
	1-5 years	30	54.03	11.88		
	5-10 years	15	56.93	12.74		
	Above 10 years	3	44.00	3.61		
Contextual ambidexterity	Less than 1 year	5	71.80	14.72	0.104	0.957
	1-5 years	30	69.27	14.95		
	5-10 years	15	70.73	16.75		
	Above 10 years	3	73.33	6.81		
New product innovation	Less than 1 year	5	66.60	1.52	0.221	0.881
	1-5 years	30	67.03	9.60		
	5-10 years	15	66.73	11.16		
	Above 10 years	3	62.33	4.62		

The aim is to identify whether Contextual ambidexterity mediates the relationship between organization context and New product innovation. A Sobel test is conducted to verify the mediation effect of Contextual ambidexterity shows that the Contextual ambidexterity does not mediate the relation between the organization context and new product innovation.

Table 8: Regression Coefficient and Sobel Test Statistics

Variables	Coefficient	Std. Error	Sobel Test Statistic	P
Organization context	.417	.142	1.132	0.258
Contextual ambidexterity	.585	.089		

To determine whether organization context of the software industry accentuate Contextual ambidexterity we calculate the correlation coefficient between the two variables and is exhibited in Table 9. The correlation coefficient indicates that Organisation context has no impact on contextual ambidexterity.

Table 9: Correlations Coefficient

		New Product Innovation Group
Contextual ambidexterity	Pearson Correlation	0.382**
	Sig. (2-tailed)	0.005
	N	53

**. Correlation is significant at the 0.01 level (2-tailed)

Measurement Model

Finally we use SEM to identify the relationship between the organizational context and new product innovation. Before modeling we find the correlation between organizational context and new product innovation to identify whether there exist any relation between the two variables and the result is exhibited in Table 10. The result indicate that a high positive correlation exist between the variables organizational context and new product innovation.

Table 10: The Correlation Coefficients for Organization Context and New Product Innovation

		New Product Innovation Group
Organization context	Pearson Correlation	0.846**
	Sig. (2-tailed)	<.001
	N	53

**. Correlation is significant at the 0.01 level (2-tailed)

In using SEM, it is a common practice to use a variety of indices to measure model fit. In addition to the ratio of the χ^2 statistic to its degree of freedom, with a value less than 5 indicating acceptable fit, researchers recommended a handful of fit indices to assess model fit. These are the Goodness of Fit (GFI), Normed Fit Index (NFI), Standardized Root Mean Residual (SRMR), and the Comparative Fit Index (CFI). Table 10 shows the level of acceptable fit and the fit indices for the proposed research model in this study. Except for the significance of χ^2 , and AGFI all values satisfied the recommended level of acceptable fit.

Table 11: Model Fit Indices for CFA

	χ^2	DF	P	Normed χ^2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Recommended			>0.05	<3	>0.90	>0.90	>0.90	>0.90	>0.90	<1	<0.5
Regression	7.362	4	.118	1.840	.949	.807	.971	.965	.986	.000	0.127

So we use the regression model to evaluate the mathematical relationship between organization context and New product innovation and the result is exhibited in Table 12.

Table 12: The Regression Coefficients for Organization Context and New Product Innovation

Dependent Variable	Independent Variable	Regression Coefficient
New product innovation	organization context	0.999
organization context	Performance management context	0.432
	Social support context	0.463
New product innovation	Radical product innovation	0.911
	Incremental product innovation	0.953
	Speed to market	0.516

From the Table 12 we have the regression equation for organization context and New product innovation *New product innovation* = 0.999 organization context

Which indicate that one percent increase in organization context result in percent increase in New product innovation. The remaining regression equation are

Table 13

Performance management context	0.432
Social support context	0.463

Organization context = 0.432 Performance management + 0.463 Social support and *New product innovation* = 0.911 Radical product innovation + 0.953 Incremental product innovation + 0.516 Speed to market.

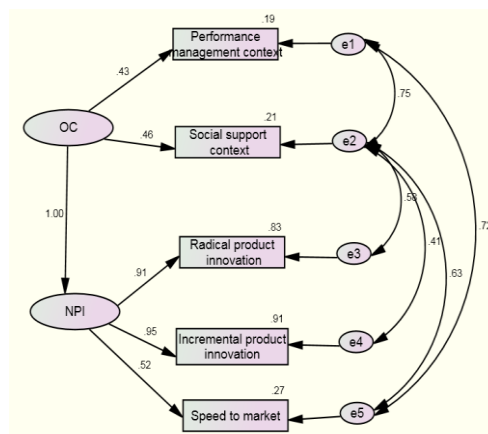


Figure 1

CONCLUSIONS

The topic and the linkages are pertinent to the contemporary innovative business unit. The study reveals the moderate level existence of organization context which support the existence of a medium level of ambidexterity in UST-Global, Kochi. The organization context which is talked of as relevant antecedent to contextual ambidexterity (Gibson and Birkinshaw, 2004), has been proved to be irrelevant in the Indian context. It doesn't have a profound impact on Contextual ambidexterity. That means managing performance and providing social support is found to have no impact on the enhancement of the competence of the employees. But the fact that there is a high correlation between Context and Innovation, is relevant to the IT organization, which bolsters the verity that context of the organization should not be undermined at any cost.

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